

OBSERVATIONS

ON THE

ADVANTAGES ARISING TO THE PUBLIC

FROM

GOOD ROADS.

PARTICULARLY,

Of the UTILITY of a short and easy COMMUNICATION
between the FRITHS of FORTH and CLYDE; with
Remarks on the present Roads leading to Glasgow.

IT is a maxim well established by political enquirers, that the power of nations, other circumstances being alike, is always in proportion to the number of their inhabitants, and the abundance of their wealth.

Those nations that still remain in their first state of nature, and subsist alone by hunting, are of all others the most thinly peopled. Islanders, who subsist entirely by fishing, inhabited only the sea-coasts; their intercourse with the internal parts of the country, almost void of inhabitants, could be little, or none at all; and public roads, across the country, at such a period, could



not be any object of their attention. Pasturage, by increasing the sustenance and number of animals on which mankind subsist, increases their numbers.

Agriculture, for the same reason, still further contributes to render a country populous.

And lastly, Trade, by bartering manufactures for food, the labour of the hand for the fruits of the earth, will, to an inconceivable degree, super-add population to a well-cultivated country. And increase of opulence, as well as of people, attends an increase of trade, as our own and every other commercial nation evinces. Therefore, whatever facilitates our trade, and has a tendency to enlarge it, deserves universal encouragement.

That turnpike roads, judiciously made, and free of every heavy pull the natural situation of the country can admit of, and in the shortest direction possible, consistent with a level, from one manufacturing town to another, and from the most commodious sea-port towns on the one side of an island, to those on the other; that such roads have a great tendency to facilitate and increase the commerce, and consequently to add to the riches and population of a country, will evidently appear from a due attention to the following particulars.

There is no part of the island of Great Britain where the east and west seas come so near each other as between the rivers Forth and Clyde; and by the new line of road proposed by Mess. Barry and Shepherd, the port

of Broomilaw and the port of Carron will be only distant a little more than measured miles.

From Glasgow to Lonehead turnpike the road will be shortened above five miles to Borrowstounness, and as much to Carron, and freer of pulls than that by Kilsyth; and by the new road from Carron-Wharf (formerly Quarol Shore) to Lonehead turnpike they will gain above two miles more than by the old road leading through the town of Falkirk.

By this short and commodious conveyance from east to west, the inhabitants of this part of the country, the gentlemen on this line of road, as well as those that lye contiguous, have great advantages over the rest of the kingdom for improving their estates, as many new manufactories may be established from the convenient situation of importing their raw materials, at the cheapest rate, from every kingdom in the world that we have any communication with, either by the east or west seas, and exporting their manufactures in the same manner. The great plenty of different ores, with which this kingdom abounds in all its hills and mountains, will, in time, be the foundation of many useful and valuable manufactories, such as the Carron company; as that whole ridge of hills lying above Falkirk, and that extend along this line of road, by Cumbernauld to Glasgow, abounds every where with great plenty of the finest coal, lime, and iron stone. A situation vastly su-

perior to any one in Great Britain, particularly for those manufactories of Birmingham and Sheffield, as well as every manufactory of iron, such as nails, hoes, &c. &c. for North-America, the West-Indies, and London markets; they having, in the central part of that road, some of the finest smith-coals that is to be met with in any part of Britain; and from the large lochs, that are in some of those high grounds, sufficient quantities of water may be conveyed, and formed into dams, for the use of slit-mills and forges, with a fall of 30, 40, 50, or 60 feet of perpendicular height, if thought necessary. There is nothing in such a noble situation wanted, but a proper attention of the proprietors of those lands to their own interest, by making that road the best and most commodious the situation of the country can admit of for heavy and broad wheeled waggons, and proper encouragement to manufacturers to settle with them; and, by adding a colony of inhabitants to their estates, will double, triple, and quadruple their value, and adorn them with towns and villages; by which these barren grounds, which at present are of little value, will rise superior to the finest lands in the vallies. As their situation for the above-mentioned manufactories are vastly superior to any other, from the convenient waterfalls, that are almost every where to be found, for the use of their mills and forges, by which means those almost barren hills, in half a century, may be cultivated

like a garden; as has happened to those parts of Lancashire and Yorkshire, where the Flemish first settled their woolen manufactories, meerly from its situation for rivulets and falls of water, for the purposes of their fulling and freezing mills, they made choice of a barren hilly country, and, in its natural state, is no better than that which in Scotland lies from Crawfordjohn to Leadhills and Moffat; and could never have been improved by the farmer, as the expence would have been too great for any thing it could possibly produce: but by letting it out in small parcels to the manufacturers, on feus or leases upon lives, they, for their conveniency and amusement, have inclosed and cultivated these barren hills and mountains, which for ever must have continued in their natural state, but are now adorned with trees and inclosures, and many of them so agreeably interspersed with houses and gardens, that those hills, for miles together, appear as one continued village. The country referred to in Lancashire is in the neighbourhood of Rochdale, Refindale, Wiersdale, Hellingden, Burnley, and Cowan; in Yorkshire, in the neighbourhood of Hallifax, Huthersfield, Bradford, Keithly, and on Blackstone Edge down to Sirbey-bridge. This barren and bleak country plainly evinces, that situation for the purposes of different manufactories is of more real value to the proprietors than the finest grounds in their vallies.

Therefore every landed gentleman and lover of his country, and who consults his own interest, and wishes to add a value to his estate, and perpetuate the same to his posterity, will on every occasion exert himself in promoting every thing that has the least tendency to encourage the manufactories of his country, or establish new ones, as they must naturally bring alongst with them an increase of useful inhabitants to the kingdom.

Though every great improvement in commerce may seem, at first, chiefly to affect the mechanic, the manufacturer or the merchant, yet much of the advantage is ultimately derived to the landed gentleman, since they who consume manufactures, or export the productions of his land, have, in many instances, above ten-fold enhanced its value. And it has been proved by many able writers, that the national success of commerce more deeply concerns the landed gentleman than the merchant himself; as the merchant at any time can remove with his effects, and try his fortune in a more advantageous situation; while the landed gentleman is bound down to the soil, and cannot remove his estate though the persons are gone who used to consume its produce.

It is obvious that good roads have a tendency to advance and perpetuate the value of estates, near which they pass, by making it the interest of the gentleman, the

manufacturer, and the merchant to dwell together in the same country, and enabling them mutually to supply each others wants. From this connection a thousand reciprocal advantages arise, which ought to banish all jealousies or apprehensions of contending interests from the minds of those whose interests are inseparable.

These roads are also directly advantageous to the landed gentleman many ways.

They give distant estates the opportunity of an easy and cheap communication with large towns and sea-ports. And the value of all lands, where the soil is equal, decreases in value according to its distance from the place where its produce is consumed or exported.

Therefore every method of lessening the expence of conveying its produce to the places of consumption must add a value to an estate. And as good roads are capable of reducing carriage one half, even in turnpike-roads, that are injudiciously made, it must be much more to those parts of the country that are impassable with carriages, and whose produce can only be brought on horseback. Therefore every estate thro' which a commodious turnpike passes, at the distance of twenty miles from a considerable manufacturing town, or sea-port, are by this means as if they were brought within eight or ten miles, as the present expence of carriage is no more than what was formerly paid for that distance of a bad and impassable road,

and so in proportion for every estate on that line of road, or that may ly contiguous to it. By this means the heavy and bulky articles, such as timber, coals, and stone that were formerly excluded (by the impassable and heavy pulls of the natural roads, which were generally chosen over every hill in the direction,) may now become articles of commerce, a circumstance of so much importance to many estates, that from an unfavourable situation, with respect to carriage, has often prevented many of those commodities from being of real value to their owners.

And it is beyond all dispute, that every country will have a superiority in commerce which can afford to sell its products and manufactures at the lowest price. Those who can lay in their raw materials, be furnished with plenty of food and fuel, and carry their goods to market at the least expence, can afford to sell them the lowest; and therefore may always have the preference, where they are not kept out by force. And it is plain, that all these consequences do in a great measure depend upon the cheapness of carriage, raw materials, and food, and manufactures, being all affected by it.

OBSERVATIONS on the present TURNPIKE-ROADS leading from GLASGOW, showing how much they cramp the MANUFACTURER and MERCHANT, in their trade and commerce; the probable reasons why the COMMISSIONERS were led to carry them in so disadvantageous a direction; with the cause of their being so soon broken and out of repair.

IT is not many years ago since our trade and commerce introduced the use of wheel-carriages, for transporting the produce of our estates in exchange for the labour of the mechanic and manufacturer; during its infancy, raw materials, food and fuel were usually brought on horse back. The communication from the country to the different towns, and from one town to another, were generally chosen by the farmer and carrier over hills, and amongst the highest parts of the champaign grounds; the country being uncultivated, and having no drains to carry off the moisture, the finest grounds in the bottom and holms were then boggy and marshy, and therefore not eligible for the traveller to go in such a direction.

The law, before application was made for turnpike roads, ordained all high-ways to be at least 20 feet wide, which was sufficiently wide at that time for the summer season. As the whole country was open, after

the crop was separated from the ground, they could leave the high road at pleasure, and follow any direction that was more commodious; there being no carts and waggons at that time, the whole produce being carried on horseback, and twenty feet was then sufficient to let a coach or rider pass carriers horses, or horses loaded with grain. That old law still continues, as to the breadth of country-roads, but at this period it wants greatly to be amended, as 40 feet is not now more commodious for the country than 20 feet was at the time it was made.

The increase of our commerce introduced wheel-carriages, that, while the country was open, could pass along in many different roads in the same direction; but by inclosing of estates they were confined to a very narrow compass, which very soon rendered those roads unpassable. The statute work in some champaign counties, by the attention of the gentlemen, as in Fife-shire, has answered every purpose of its intention; but in the neighbourhood of great towns, and in parishes thinly peopled, clay grounds and materials at a considerable distance, and the communication leading through them between two considerable towns, it was impossible they could make roads fit to support heavy carriages.

The great roads having become almost unpassable, and consequently advanced the price of carriage, and pro-

duced many disappointments of food, fuel, goods, and raw materials to the merchant and manufacturer, made it absolutely necessary for them to apply to Parliament for road bills, which were described to go in the old direction.

The old line of road when it was first formed was judicious, and the only possible way that individuals could have intercourse with each other. But what was proper in the state of a country uncultivated, and almost void of trade and commerce, was very injudicious and improper of late years, when both were arrived to a considerable height.

The improvement of lands by inclosing them, has, in many places, doubled and tripled their value to the owners, and are a great ornament to a country, but have had very bad effects in the direction of the roads, in many places. For the sake of straight lines, and to make square inclosures, they have carried the road for some hundred yards along the side of a rising ground, or on the top of a ridge, and then turned it down a very steep hill, at a right angle, along the side of an inclosure, for a very considerable distance; and besides the bad pull produced they added to the length of the road, as the two sides of a right angle is to the base, which was the old direction of the road for time immemorial. Those gentlemen never apprehended the damage they were doing their country which experi-

ence has since taught them, that every heavy pull thus industriously made on any principal road, in the distance of 8 or 10 miles, was cramping the merchant and manufacturer, by increasing the price of carriage one penny per hundred weight, on all goods, raw materials, &c. as is evident from the present prices of carriage paid on the different turnpike-roads leading from Glasgow, at that distance. In this situation were many parts of the principal roads in Scotland when the gentlemen applied to Parliament for turnpikes.

The commissioners residing on their estates, and many of them having no occasion to travel through England, or be acquainted with the commissioners in that country, where turnpike-roads had taken place many years before ours, and from them might have understood the spirit of the law, and the powers with which they were vested, viz. That places mentioned in road bills of being carried by and through, were only descriptive of the country through which such roads were to be carried; but the power of deviation, and to render them the most commodious for carriages and the purposes of trade and commerce, was solely in them, and that they had powers of purchasing lands any where in that direction to render them most useful to the public.

The commissioners in this country, not understanding the spirit of the road law, apprehended they were

obliged to keep strictly to the old line of road mentioned in the bill, at least as near it as possible; and by the many hills and heavy pulls in the present turnpike-roads, the price of carriage is near double what it ought to be, if such roads had been carried level, and in the shortest direction.

The Lords of Council and Session, so late as 1762, appear to have been as little acquainted with the spirit of that law as the commissioners; for by a decret passed on the Cumbernauld-road, they oblige it to be carried in the old direction, and up the Hole-brae, a steep hill, from 500 to 600 ~~feet~~, of which 70 to 80 ~~feet~~ rises one in three, and, on an average, the whole one in five; and from the deep glens or gullies on one side, the direction is fixed to the present line it is carried in.

However, their Lordships, in July 1765, upon a suspension being raised by one of the trustees about the directions of the road leading "through Souttriehill by "Channel-kirk, Greenlaw, and Antenshill, to the side "of Tweed opposite to Coldstream." ~~The trustees insisted~~

X ~~that~~ that the complaint was incompetent before the Court of Session. The act of Parliament has expressly declared; "That if any person, or persons, shall think "him or themselves aggrieved by any order or other "proceedings of the said trustees, it shall and may be "lawful for him or them to appeal to the justices of "the peace of the county where the complaint shall

X ~~Altered their opinion and found that disputes amongst Trustees was a matter that could not be decided by them. The following reasons were pleaded by the Majority of Trustees against the Honorable Suspension.~~

“ arise, in their general quarter-sessions assembled, and
 “ are hereby authorized and impowered to hear and
 “ determine the matters in dispute, and whose order
 “ thereon shall be final and conclusive.” Under the authority of this statute, the trustees plead the incompetency of their Lordships jurisdiction, as the objection seemed to be clearly founded in the words of the clause above recited; and observed that the duration of the act of Parliament was only for the space of twenty one years.

Now, if it was in the power of every person, who chused to set up his private judgment in opposition to that of the majority, to make that the subject of a tedious litigation before a court of law, the period of the act of Parliament would expire before half of the purposes of it could be fulfilled; and that the justices of the peace, acquainted with the characters of the people in the country, and residing upon the spot, are certainly the most competent judges in controversies which are purely local, and not involved in any nice intricacies of law.

They likewise denied that the difference of opinion amongst trustees, acting under the authority of an act of Parliament, is such a matter of dispute as can be judged of by any court whatever.

The Noblemen and Gentlemen, intrusted with the execution of the act for repairing turnpike-roads, are

trustees for the public in that matter, and are bound to answer to the public for their conduct. But it is in the power of no court to direct them in their conduct, as to determine in any difference of opinion that may be amongst them; and when they happen to differ in opinion, as to the propriety of any measure, it is the majority of voices that can only determine what is to be done. And further observed, that it was not uncommon for trustees appointed by the deeds or settlements of private persons, for the management of estates, or the execution of other pieces of business, to differ in opinion amongst themselves, as to the execution or administration of what is committed to them; but it was never known, that one of such trustees, or a minority of them, did ever attempt to suspend the execution of what was resolved upon by a majority, upon the ground of the resolution taken being improper or inexpedient in the execution of the trust: If any such attempt was to be made, the action would be most justly thrown out by the courts of law, as respecting a matter not the subject of jurisdiction. For as the truster had committed the execution of the trust to a certain number of persons chosen, it is they only that could judge of what was fit to be done, and when they differed in opinion, the majority must determine, when no other provision was made in the trust.

The same thing must undoubtedly hold in the present case, and there is the highest expediency in it; for, where the trustees are so numerous, if difference of opinion was to be made the subject of law proceedings, it might often prevent the execution of the trust altogether; and, at any rate, it would frequently create the greatest embarrassment in matters of this kind.

The Lords having considered the bill, answers, replies and duplies, they refused the bill.

By this incompetency of the Court of Session, to judge in road bills, the commissioners will find themselves vested with full powers for making every new road in the most commodious manner, and likewise of altering the direction of those heavy pulls in the present roads, that, for many years past, have been like a mill-stone about the neck of the merchant, manufacturer, and mechanic, by paying near a double price for carriage of food, fuel, and raw materials; and his manufactures loaded in the same proportion in going to market, which must be a great draw back on his profits, and greatly cramp the intention of his trade, by bringing them to market with so much expence, and give our rivals great opportunities of underselling us.

But as it has been already shown, that the interest of the landed gentleman, the merchant, and manufacturer are inseparable from the many reciprocal advantages of supplying each others wants, and that eve-

ry thing that promotes and increases the trade and manufactures of a country, adds a value to the landed interest thereof, and by making that situation the most commodious for their residing and dwelling amongst them, will likewise perpetuate the value to their posterity.

So many and important are the advantages that will undoubtedly arise to the public, from the intended road, as surveyed by Mess. Barry and Shepherd, as also in altering the direction of the old ones in the shortest and most commodious line possible, free of all heavy pulls, that, we presume, an attentive consideration of them must convince every one that they infinitely outweigh all the inconveniencies that can be supposed to attend it. And it is to be hoped, every friend to his country will be cautious of giving weight to trivial inconveniencies, in opposition to improvements, that are of such importance to the country, especially at a time when our manufacturers are suffering for want of the usual demand for their goods, and when several rival nations, as well as our own colonies, are availing themselves of this opportunity to seduce our workmen, in many branches, to leave the country, and contribute to the support of these alarming competitors.

We shall therefore point out the objections to the present line of roads leading from Glasgow, and describe the manner in which they may be remedied.

From the turnpike-gate at the Gorbals to the turnpike at Paisley is almost a dead level, and no pull any where to be found that might not be reduced to 1 foot at 30 or 40, by leading the direction of the road a little to the south of the present one, on the level ground, at the foot of the hills where the present road passes over. But by following the old line of road, it passes over four hills, three of which have a very considerable pull on both sides.

By this means the price of carriage is at 5d. per hundred to the most considerable manufacturers, who employ them daily, and to others at 6d. which, for the distance of eight miles upon a level road, ought not to exceed 3d. per hundred.

Therefore three pulls, on a very public turnpike-road, of eight miles, costs the public near 1 penny per hundred for each pull, and affects food, fuel, raw materials, and goods to the individuals of Paisley and merchants of Glasgow near one half of additional carriage, and, upon a very moderate computation, must be near two thousand pounds a-year.

The road from Glasgow to its ports, is necessary to convey goods for exportation, in the summer, when the river is very low, and in the winter, when it is frozen up; and at all times considerable quantities, that could not be got ready to go by water along with the principal parts of their cargoes; and rather than loose the op-

portunity of a ship going to a particular Island or river in America, the merchant chuses to send them by land-carriage, although at a much greater expence.

That part of the road to Crofshill is very good, and no pulls of any consequence, that cannot easily be remedied, and at a very small expence. But from that to Port-Glasgow is one continuation of ascents and descents, for the space of six or seven measured miles; by which the merchant and manufacturer pays after the rate of 15 d. and 16 d. per hundred, and if it had been carried in a proper direction, from Crofshill to join the old road along the river, it ought not to exceed 8 d. or 9 d. and is not at a greater distance than Carron, on which road, when made, all goods may be carried to Glasgow for 8 d. and back carriage at 6 d.

But the paying near double what that length of road ought to be is a matter worthy of their attention, as that additional sum must be very considerable in dry seasons and in hard winters. And we presume, that the noble Peer, who was misled in its present direction, will chearfully contribute to the relief of the town of Glasgow and its ports.

It may also be observed upon the two roads leading from Glasgow to the shire of Ayr, the one by Nielson, and the other by Pollock, that notwithstanding the Toll-bar on the former has been removed, for these two years past, to induce carriers to go that way, yet there

is scarcely a loaded cart, in the whole season, which passes that way to Kilmarnock, Irvine, or Ayr; they rather chuse to pay the toll in the Pollock road, than go free by Nielson; because the pulls are more gentle and gradual on that road than the other, and find from experience, that every single horse-cart can draw two hundred weight, and double ones four, with more ease to themselves; therefore, while it continues in that direction, it will be the interest of every carter to go by Pollock, if the tolls were a shilling.

Craig-Naught and Nielson hills, and Pollock wood, are such steep hills that they cannot possibly admit of carriages being so heavily loaded as the other road, and the commissioners will find, that the money expended on that road, in the present direction they have carried it, will not defray the expence of building a toll-house and gate, and pay the collectors wages. Thus while a very considerable sum of money, expended in that road, is sunk, Sir Robert Pollock, by a more judicious direction, receives 10 per cent for the money laid out on the road by Pollock; the expence in making whereof, cost not more than from 70l. to 80l. per measured mile, while the other cost 200l.

The publick have no reason to doubt, from the great attention Sir Robert has paid to the interest of that part of the country, that so soon as the gentlemen in the shire of Ayr do agree to make the roads leading from Stew-

arton to Irvin and Kilmarnock, that he will again exert himself in removing every pull on that line of road, to make it the most commodious communication from Glasgow to the West Sea that the natural situation of that country can admit of; by which means he will establish and perpetuate it, and add a considerable value to the whole estates through which it passes, and to whom the proprietors of those lands are greatly indebted.

This circumstance of the two roads, we hope, will sufficiently convince every commissioner, that all roads, carried in a direction over hills, with sudden and heavy pulls, can never answer the purposes of commerce.

And that every carrier will avoid them, although free of all toll, it being more his interest to pay 6 d. or 8 d. at the turnpikes of a commodious road, while they gain by the additional quantity of carriage, three or four shillings.

And it may here be observed, that short roads is not of so much publick utility as level ones; a horse being more fatigued and strained in pulling up a steep hill, of 30 or 40 yards, than if he had gone round 3, or 4 miles on a level road.

In the road leading from Glasgow to Kilsyth, at the distance of half a mile from the town, you go up the one side and down the other of Peters-hill, being 1 foot in 12 for 200 yards on the one side, and 120 on the other, which might have easily been avoided by turn-



ing to the right round the bottom of the hill to Flemington, where they could have joined the present road near in a level; and, instead of going up that steep ascent on Balgra-moor of 240 yards, that rises 1 in 12, they ought to have taken the skirt of the hill upon a level, under the moor, above the Coltston grounds, all the way to Crue-hill; and, by going a little round (but in a shorter direction to Calder) you avoid any pull the whole way; or, by cutting down three or four yards of the skirt of the hill, you may land upon a level at the bottom, near the Crue houses, where the present road makes that invincible pull of 200 yards long, of 1 in 8.

From Bishop Bridge to Beer-yards you ascend, for 240 yards, 1 in 20, which may easily be remedied by throwing down a few yards of the top into the hollow, and by that means every yard of perpendicular height, thrown into the hollow, would make a difference of two yards as to its level. From that you go almost north to Calder-kirk, and when you have got there you are only a few hundred yards farther east, after travelling near two miles. From that to Kirkintilloch, the road goes in a proper direction; but to make it the most commodious for the communication it was intended, it ought to be carried in a straight line from Bishop Bridge to Kirkintulloch, which would have shortened the road above half the distance from Bishop Bridge to Calder.

The pull on both sides of the town of Kirkintilloch, being a rise and fall for 200 yards of 1 in 14, and ought to be turned round the skirt of the hill, on the north side, which would bring it to a level.

From that you go to Inchbelly, but ought by no means to have crossed the river there, but carried it in a straight line up the level ground by Shervey and Auchinvole, and by that means saved about 2 miles in the length of the road, and that without any pull, there not being any rise of 1 foot in a hundred. But in crossing Inchbelly-bridge you go northwards to Campsaw, and describe a circle to Kilsyth of near two miles round, and pass over several hills and precipices of very heavy pulls, viz. Inchbelly-bridge rises and falls, on an average, 1 foot in 10 for fifty yards;

Inchwood rises 1 in 10 for 120 yards;

From that to Guinie burn 1 in 20 for 200 yards;

From that a fall to the burn of 1 in 8 for 200 yards;

Smithy hill, a long rise and fall, for 3 or 400 yards of 1 in 20.

At Kilsyth you no sooner pass the toll but you ascend that unpardonable piece of road made over Barr-Hill, 70 yards of which rise one in 7, 120 yards one in 8, 240 yards one in 10; and then go down the other side, 260 yards of one in 9.

The whole might have been easily avoided, by a gentle sweep round the hill, and joined the road on

the other side, nearly upon a level, and the expence of making would not have exceeded one third of that made over the hill. The rest of the pulls, from that to Lonehead turnpike, are only short ones of 1 in 15 and 20, and may all be avoided by carrying the direction of the road along the base of those hills, over which it passes. But until that of Barr-hill is removed, it is of no consequence, as the carter or waggoner will find no difficulty in surmounting short pulls of 1 in 15 and 20, when he has ascended a steep hill of 4 or 500 yards, rising from one in 7 to one in 10.

Therefore unless the above alterations pointed out are made on that road, it cannot be considered in the light either of a short or commodious road, leading from the Frith of Clyde to the Frith of Forth; but may remain in its present direction as a small improvement of the old natural road, for the farmers to transport their produce to the east and west, supportable by the statute-work.

In the road leading from Glasgow, by Cumbernauld, to Red-Burn bridge, you immediately ascend a precipice, called Gads-Hill, that is almost inaccessible for carriages, by the long and heavy pulls on both sides, that no double horse-cart can draw so much, by one third, with the same ease as he can do on the level. And it is certain, that no carter, for the sake of his horse, will at any time load above $\frac{3}{4}$ on his cart, that

he would do if the direction was in the low ground, below the hill. There is not a rise of more than 3 or 4 feet from the level of the present public road to Kilsyth and Gads bridge, and that line of road considerably shorter.

You no sooner pass Gads bridge than you ascend another steep-hill to Germingston, which might easily have been avoided, by taking the slope of the hill on either side, which would bring you to Provan-Mill, nearly upon a level.

At Milton you ascend a hill with a considerable pull, and after that another with a greater, and go along a ridge of high-grounds, for a considerable way, and then go down a steep hill on the other side, while the old line of road, at this place, is much better chosen than most in the country, as it turns to the left, along the skirt of the hill, so soon as the situation of the grounds will admit of it, and goes along the base of that ridge of hills by the side of the moss, and free of every pull, being almost a dead level.

When you come to Garnkirk, where his enclosures approach too near for a turnpike-road, it will be necessary to level them on one side, and in some parts on both.

At Chrifton, within these few years, the old line of road is enclosed that went down the slope of the hill to Burthlane-bridge, and the public road is turned down

a steep hill, and carried up another called Wallflats-hill, where you go down the other side, which is likewise very steep to the aforesaid bridge; by this means the direction of a public turnpike-road is turned round 3 or 400 yards, for the sake of making a square inclosure; and besides the length of the line of road, there is added three considerable pulls, which was done without the approbation of the trustees.

From Mullens burn to Craighead, along the side of Banheath park, there is a very steep hill of 400 yards long; on the other side of that hill a heavy pull, and another at Craighead house.

From Myvet to Powdret, a long and steep pull.

Powdret and Loggie water often overflow the low grounds, in which the present road passes, for the space of 5 or 600 yards, so as to render it impassable for travellers. By an estimate of three surveyers, appointed by the Court of Session, the expence of a bridge, with the number of arches requisite, would cost 2100 l.

From Loggie water to Chapelton, a pretty steep pull of 60 yards; another very steep one below Broomlands, of the same length.

A long pull by Langlands inclosures; and a little higher is a very heavy pull at Seafare, of 50 or 60 yards.

From that you come to Cumbernauld parks, at the head of the Hole-brae, a steep hill of 5 or 600 ~~feet~~ long, 70 or 80 of which rises 1 foot in 3; and, on an ave-

yards

rage, the whole hill rises 1 foot in 5, and from its situation with glens and gullies on one side, there is no altering of the present direction it is carried in.

At the bottom of this hill is a ruinous bridge, with a very steep hill up to the town of Cumbernauld.

At the east end of Cumbernauld is another ruinous bridge, and from which you ascend a very steep pull, rising 1 foot in 4 for 80 yards, and above that a long and heavy pull of 200 yards more, of one in 10.

A little to the east of Gateside, a very steep pull for about 200 yards; and a little further, another of the same length.

The Red Burn Brae at present rises 1 foot in 6 for above 200 yards; but by turning round the skirt of the hill, and going in the hollow part of the adjacent field, until you join the present road a little from the present toll-gate, it may be made to the level of rising 1 foot in 20.

From the above description of this line of road it will plainly appear, that the trustees acted very prudently in not making a road that they were fully satisfied could not be of public utility.

It may not be improper to add here to the foregoing remarks on the roads leading to Glasgow, the inconvenience arising within the town of Glasgow to carriages entering at the town-head, or brought from the other quarters to the town-head, from that steep hill called

the Bell of the Brae. This inconvenience has been long felt, and loudly complained of, and yet it is wonderful that no step has been hitherto taken to remove it, especially as an easy remedy is at hand, and very practicable.

There is nothing can be more injudicious than the usual practice, in this country, of leaving the turnpike-roads uncovered, by which means the carriages, in a few years, cut through the foundation.

The whin, or gray porphyry, that pave our streets, are not sufficient to support heavy loaded carriages, without being often out of repair; and in narrow streets when loaded carts pass in one constant tract, (a practice peculiar to all carters in Scotland, who seldom or never quarter their ground, if they can find an old tract or rut to go in,) they cut them quite through, as may be seen in that street leading from the North-West church in Glasgow, to the stone quarries, where those heavy loaded carriages have cut that hard pavement in gutters of five and six inches deep.

Therefore the free-stone, with which the foundation of our roads are laid, cannot possibly stand any time, when uncovered, and must immediately produce the effects that appear every where on the roads near the town, and particularly on that leading to Kilsyth, the reparation of which will cost very little short of making a new line of road in its natural direction.

The foundation of a road being only intended to support the covering from being pressed into the clay or soil, but by no means ought to be left bare and cut through, which must render a turnpike road much worse than any other, and endanger the horses legs, when they sink through the foundation, of being broken, in pulling them out of such holes, whose sides are lined with stone, especially if a horse is going at any speed, by which the weight of his body is thrown forward before he can disengage his feet, and renders such roads, of all others, the most dangerous for travelling, and on which no person can, with safety to himself or his horse, go at any other rate than a foot pace, who, in a country road equally deep, would go on at a smart trot.

Therefore whatever expence may be necessary to keep a turnpike road well covered, and free of every hole or hollow, wherein water can settle, it will be found from experience that doing otherwise will cost the trustees double and triple the sum in the end, and by such management, it will soon be in a ruinous condition, to the great disadvantage of trade and commerce, by an additional expence of carriage, during that situation; and the repairing of it will cost a sum equal to its first forming.

It therefore appears absolutely necessary, that all turnpike-roads should be kept well covered. And as

contractors seldom consider the trustees or the public, but in how far they can have an advantageous bargain; Few of them seem either to understand the proper method of keeping them in repair, or of doing that at the least expence; as they generally let them be too far gone before they think it necessary to do any thing to them, and that is often done in the summer, without paying any attention to them during the winter; in which season they are mostly damaged, owing to their want of knowledge, at least of their own interest.

Whereas, if they employed a man at weekly wages, on a line of road of 1, 2, 3, or 4 miles, according to its nearness or distance from a considerable town, for the repairs upon that road, and furnish him with sufficient quantities of materials, laid down by a carter all along its sides, and furnish him with a hand cart to remove it according as it was necessary, to fill up all ruts and such places as any water could settle on. By this means it would be always kept dry, and not liable to be broke into holes as all roads must necessarily be, wherein water is allowed to settle and sink down to the foundation.

And when heavy-loaded waggons make the least rut, to fill them up immediately, and keep them smooth during the winter; and if that is properly attended to, during that season, they will receive very little damage in the summer; and by filling up every little hole at first

with a small quantity of materials, the turnpike-roads would always continue equally good, and the price of carriage uniformly the same in the winter as the summer.

Contracts on roads would be much more advantageous to the trustees, if, instead of paying so much a mile for keeping them in repair, they paid the contractor a certain sum for each cart or waggon load of materials he laid on it; and to agree with some common labourer, in the neighbourhood of that road, at so much a-week, for laying them on in proper places, and making ruts to discharge off the water; then the whole sum of money expended on that road, would be for materials only, and if properly distributed by their own servants, would be a great saving in the article of expence, as well as of great public utility, by the good roads it must naturally produce.

Having endeavoured to shew of what importance trade is to national prosperity, and in what manner it connects the interest of the landed gentleman and merchant; in what respects good roads become beneficial to trade and agriculture; and how far an injudicious conduct of them may defeat this intention: it remains to be evinced, what immediate advantages result to the public from an easy and short communication betwixt the Friths of Forth and Clyde.

By this medium all the manufactures of the west

country, and the produce of America, brought into these parts, will find a cheap conveyance to market, whether to the inhabitants of Scotland on the east coast, or for exportation to London and elsewhere. On the other hand, the inhabitants of the west will be supplied with these articles required from London, Germany, Denmark, Sweden and Russia; also with the productions of our own country requisite for manufactures, or exportation to the British colonies in America, such as white and brown linens, Osnaburghs, yarns, and stockings; but above all, and what is of the greatest consequence, their being supplied in is that of grain and meal. As this article in most years, can be had in abundance from the north country, it surely concerns us to purchase it there, rather than any where else, if it can be delivered to the consumers upon nearly equal terms with what it can be imported from England or Ireland. That great sums have been sent out of the kingdom, for some years past, in order to purchase, in these places, is a melancholy truth, which, it is hoped, will be prevented hereafter.

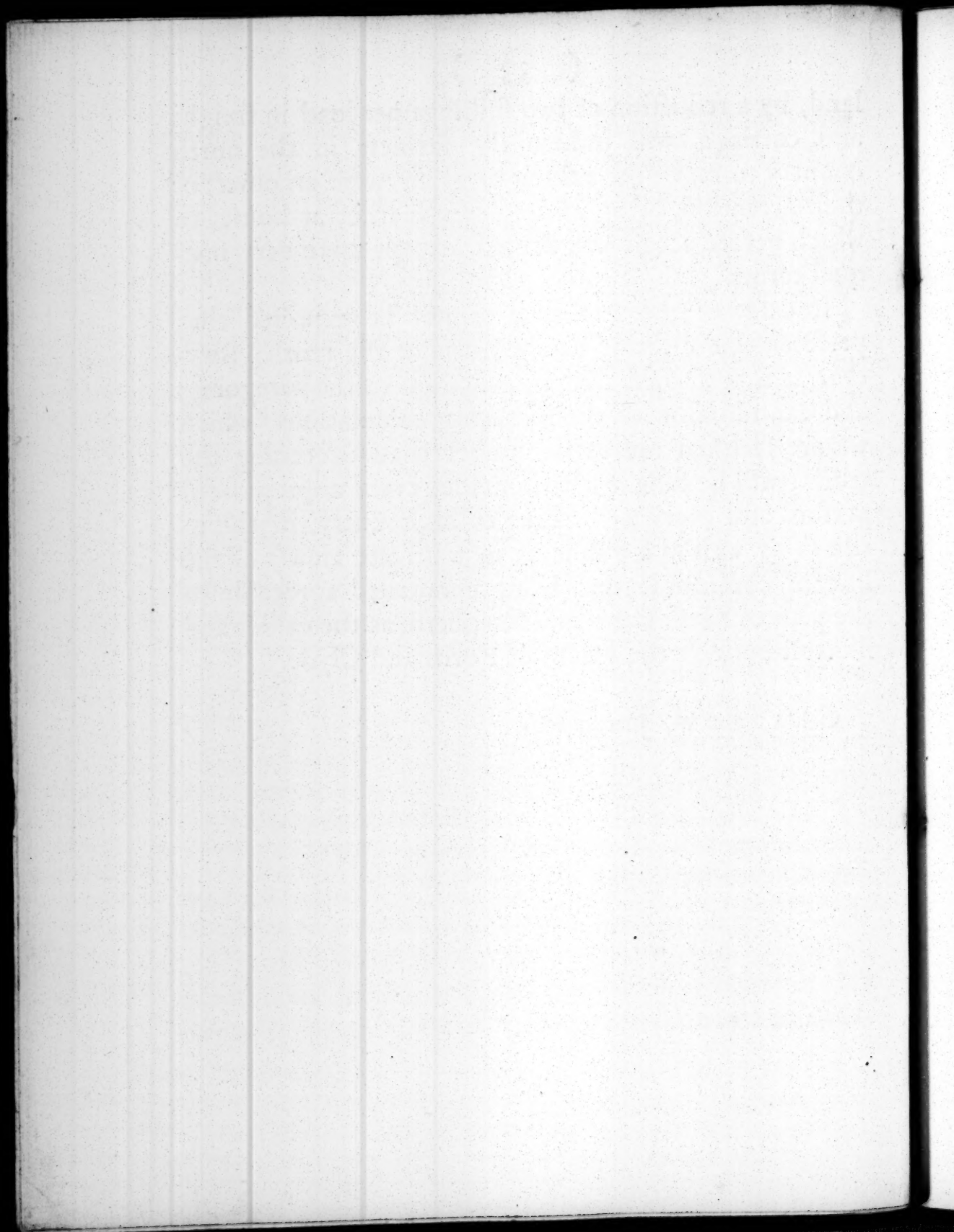
The constant exportation of coals, cast metal, &c. from Carron to all the parts of Scotland on this side the Orkneys, will enable them to lay down grain of all kinds at Carron Wharf nearly as cheap as at those ports, as it will come in return in place of balast. Therefore this easy and cheap communication from the north of Scot-

land, by a reduction of two shillings per load in freight and carriage, will induce the farmers in the north country to make the raising of grain more an object of their attention, being assured of a market at home, to which before access was denied, except upon very unequal terms.

In cases of this nature it cannot be expected that perfect demonstration can be given of the truth; however, it is presumed that an attention to the foregoing, and examination of the following calculations (which we are satisfied are rather under than exceeding the truth) will be sufficient to convince every unprejudiced person, and every well-wisher to his country, of the utility (as well in a public as in a private view) of the line of communication being conducted agreeable to the plan of Mess. Barry and Shepherd, as the easiest and shortest betwixt the Friths of Forth and Clyde.

GLASGOW, Jan. 1766.

E



ESTIMATE of the present Carriages between the City of Glasgow and the Frith of Forth, with the Savings on transporting Merchandize from Borrowstounness and Carron, by the Roads through Kilfyth, and by the New Intended Road by Red-burn and Loggie-water.

	BO-NESS.			CARRON			OLD ROAD.			NEW ROAD.							
	Road.						Old road.			New road.							
	Present Price.						Present Price.			Intended Price.							
	s. d.	l.	s. d.	s. d.	l.	s. d.	s. d.	l.	s. d.	s. d.	l.	s. d.					
1mo. ABSTRACT of an average of 10 years importation of corn, meal, &c. from 1752 to 1762, taken from the custom-house of Borrowstounness, viz.																	
53020 load imported																	
16368 growth of Stirling, &c.																	
69388 at 8 to the ton is 8673 at	23	4	10	18	10	0	18	4	7950	5	0	13	4	5780	00	0	
2do. Twenty-four ships of 150 tons each, trade between London and Leith, Borrowstounness and Carron. Allow only six ships to come down full, and go up half full. Six ships make 24 voyages per annum, which at 150 tons																	
3600 downwards																	
and one-half 1800 upwards																	
5400 tons at	23	4	6	300	00	0	18	4	4950	00	0	13	4	3600	00	0	
3tio. Goods imported from, and exported to, all the other ports on the east, from Yarmouth to Orkney, amounting to 1800 tons at																	
	23	4	2	100	00	0	18	4	1650	00	0	13	4	1200	00	0	
4to. Iron, deals, pot-ashes, hemp, flax, flax-feed, and country carriages, amounting to 1000 tons at																	
	23	4	1	166	13	4	18	4	916	13	4	13	4	666	13	4	
Present annual carriage - - -				19	685	3	4		15	466	18	4		11	248	13	4
Present saving by Carron - - -				-	-	-	-		4	218	5	0					
									19	685	3	4					
Saving by Carron, intended new road	-	-	-	-	-	-	-	-	-	-	-	-	-	8	436	10	0
														19	685	3	4

The Number of carriages Employed on the Roads from the Frith
of Forth to the Frith of Clyde. viz.

From the town of Falkirk	60 Double Carts.
20 Single	10
Stirling	10
Borrowstounness	10
Kilsyth and Kirkintilloch	20
Larbert and Dermv	16
Glasgow &c.	20
	146

Suppose no more to each cart
than a loading and a half
weekly at 20 Ct. Wt. the
loading is 11388 tons at 23 s. 4 d. 13286.

Add Carse farmers, farm corn,
single carts and horses
one half 5694 at 23 s. 4 d. 6643.

L. 19929

At this rate the carters can only acquire as follows,
The expence of a double cart and 2 horses at 1 s. 2 d.
per day each for 1 week is 16 s. 4 d.
A man living abroad 3 days 8
Turnpikes coming and going 3 9
Tear and wear of horse and carts, grease, &c. at 1 s. 7

L. 1 15 1

Cartage of 30 Ct. Wt. at 1 s 2 d. is 1 l. 15 s.

The Number of Measured Miles from Borrowstounness and Carron by the Old and New Road leading to the City of Glasgow.

	Borrowstounness.		Carron.	
	New road.	Old road.	New road.	Old road.
From Borrowstounness to Loanhead		13 $\frac{1}{2}$		
From Loanhead to Glasgow		13		
	Miles	26 $\frac{1}{2}$		
From Borrowstounness to Falkirk		8	2	
From thence to Inchbelly-bridge		14	12	
From Inchbelly-bridge to Glasgow		8	2	
	Miles	30	16	
From Glasgow to Redburn			12	
From Redburn to Carron			5 $\frac{1}{2}$	
From thence to the wharff			3 $\frac{3}{4}$	
	Miles		18 $\frac{3}{4}$	
From Glasgow to Loanhead by Kilsyth			16	
From thence to Carron wharf			6 $\frac{1}{4}$	
	Miles		22 $\frac{1}{4}$	

The number of pulls in the present road leading from Glasgow to Falkirk, by Kilfyth, in the space of ten computed miles.

		Yards.	Yards.
Peters-hill	rises 1 in 12 for	200	
Ditto falls in the same proportion,	1 in 12 for		120
Fulton's Folly at Balgra Muir	rises 1 in 12 for	240	
Cruehill	falls 1 in 8 for		200
Bishop-bridge to Beer-yards	rises 1 in 20 for	240	
Kirkintilloch on the west and east	rises and falls 1 in 14	200	200
Inchbelly-bridge	rises and falls 1 in 10	50	50
Inch-wood	rises 1 in 10	120	
From that to Guinie-burn	rises 1 in 20	200	
From thence falls to the Burn	1 in 8		200
Smithy hill, a long pull,	rises and falls 1 in 18 or 20	350	350
East of Kilfyth toll-bar, a steep pull up,	rises 1 in 7	70	
From thence towards the middle	rises 1 in 8	120	
From that to the top of the hill	rises 1 in 10	240	
From the foot to the top of the same hill	falls 1 in 9		260
		2030	1380

The rises and falls on the new line of road proposed by Mess. Barry and Shepherd, from Glasgow to Logie water, farm of Wester Ardrie and Red Burn-bridge.

From Red Burn-bridge to where it joins the turnpike-road leading to Glasgow,	a rise of 1 in 20 for	250	
To Mainhead, in one direction,	a rise of 1 in 30	} for 480	
in another direction,	a rise of 1 in 40		
At Craigharbert	a fall of 1 in 20 for		80
		730	80

The whole road from that to Glasgow is free of every pull, and is almost level.

N. B. It's worthy of notice, that, in proportion to the acclivity of any ground, the force must be increased, or the weight diminished, in order to carry the load up. Considered in the later view, the following diminution of weights is requisite,

In an ascension of one foot in twenty feet 140 lib. diminution.

1 ditto in 18	155
1 ditto in 16	175
1 - 14	200
1 - 12	233
1 - 10	280
1 - 8	350
1 - 7	400
1 - 6	466
1 - 5	560
1 - 4	700
1 - 3	933

The above calculation being founded on a supposition of the load being one tun, and the carriage 5 Ct.

N.B. any person who is in possession of this may ~~at~~ call at Mess^{rs} Goullis who will deliver them a copy of the calculations more fully illustrated.



